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Notice of Allowability	Application No.	Applicant(s)	
	10/603,544	MAY, MARCUS W.	
	Examiner	Art Unit	
	Jean B Jeanglaude	2819	
The MAILING DATE of this communication appe All claims being allowable, PROSECUTION ON THE MERITS IS herewith (or previously mailed), a Notice of Allowance (PTOL-85) NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RI of the Office or upon petition by the applicant. See 37 CFR 1.313	(OR REMAINS) CLOSED in this app or other appropriate communication GHTS. This application is subject to	olication. If not include will be mailed in due	ed course. THIS
1. This communication is responsive to <u>06-25-03</u> .			
2. ☑ The allowed claim(s) is/are <u>1-18</u> .			
3. \boxtimes The drawings filed on <u>25 June 2003</u> are accepted by the E	xaminer.		
4. Acknowledgment is made of a claim for foreign priority uner a) All b) Some* c) None of the: 1. Certified copies of the priority documents have 2. Certified copies of the priority documents have 3. Copies of the certified copies of the priority documents have International Bureau (PCT Rule 17.2(a)). * Certified copies not received: Applicant has THREE MONTHS FROM THE "MAILING DATE" noted below. Failure to timely comply will result in ABANDONM THIS THREE-MONTH PERIOD IS NOT EXTENDABLE. 5. A SUBSTITUTE OATH OR DECLARATION must be submit INFORMAL PATENT APPLICATION (PTO-152) which give (a) including changes required by the Notice of Draftspers 1) hereto or 2) to Paper No./Mail Date (b) including changes required by the attached Examiner's Paper No./Mail Date Identifying indicia such as the application number (see 37 CFR 1. each sheet. Replacement sheet(s) should be labeled as such in the depose attached Examiner's comment regarding REQUIREMENT sheet in the depose attached Examiner's comment regarding Requirement sheet in the depose attached Examiner's comment regarding Requirement sheet in the depose attached Examiner's comment regarding Requirement sheet in the depose at the depose attach	been received. been received in Application Nocuments have been received in this for this communication to file a reply lENT of this application. itted. Note the attached EXAMINER as reason(s) why the oath or declarated be submitted. son's Patent Drawing Review (PTO-communication) and the communication of the Communication of the Communication of the drawing the header according to 37 CFR 1.121(constituted).	complying with the recomplying attached with the recomplying action of the recomplying and the recomplying in the front (not the recomplying in the front (not the recomplying in the submitted. It	quirements IOTICE OF
Attachment(s) 1. ☑ Notice of References Cited (PTO-892) 2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948) 3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/0 Paper No./Mail Date 4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material	8. 🛭 Examiner's Stateme	(PTO-413), e nent/Comment	owance



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Reasons For Allowance

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Claims 1 – 18 are allowable.

The following is an examiner's statement of reasons for allowance: in 1. combination with other limitations of the claims the prior arts made of record fail to suggest a digital to analog converter that comprises a conversion control operably couples a first set of a plurality of current sources to an inverting input or non-inverting input of a differential amplifier in accordance with a first set of bits of a digital input and couples, via at least one inversion, a second set of a plurality of current sources to an inverting or non-inverting input of differential amplifier based on a second set of bits of the digital input. Moreover, in combination with other limitations of the claims, the prior arts made fail to suggest a digital to analog converter that comprises a plurality of switching modules wherein each of the plurality of switching modules is operably coupled to a corresponding current source of a plurality of current sources, wherein a first set of the plurality of switching modules couples the corresponding current sources to a differential amplifier module in a first manner based on a digital input value and a second set of the plurality of switching modules couples the corresponding current sources to the differential amplifier module in a second manner based on the digital input such that, over time, errors introduced by the coupling in the first manner substantially compensate for errors introduced by the coupling in the second manner. Also, in combination with other limitations of the claims the prior arts made of record fail to suggest an apparatus for digital to analog conversion that generates a first signal based on each bit of a first set of a plurality of bits is in a first state and based on an



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plurality bits that is in the second state.

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inversion of each bit of a second set of the plurality of bits that is in the first state; generates a second digital signal based on each bit of the first set of the plurality of bits that is in a second state and based on an inversion of each bit of the second set of the

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

- 2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
- 3. Wilensky et al. (US Patent Number 3,857,021) discloses a multiplying current mode DAC.
- 4. Tokuhiro (US Patent Number 5,028,926) discloses a successive ADC with a variable reference voltage for the DAC.
- 5. Sako et al. (US Patent Number 5,148,161) discloses a digital signal processor for fixed and floating point data.
- 6. Huang et al. (US patent Number 5,870,049) discloses a current mode DAC.
- 7. Okuda et al. (US Patent Number 5,995,031) discloses a DAC an ADC.
- 8. Bult et al. (US Patent Number 6,414,618) discloses a DAC with reduced ringing.
- 9. Leung et al. (US patent Number 6,448,917) discloses a DAC using current source driving main resistor string.

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10. Isobe et al. (US patent Number 6,549,154) discloses a DAC and synchronous circuit using the converter.

- 11. Moser (US patent Number 6,549,156) discloses a method of forming a semiconductor device and structure therefor.
- 12. Clara et al. (US patent Number 6,593,868) discloses a differential DAC.
- 13. Khoini-Poorfard et al. (US Patent Number 6,639,534) discloses a DAC switching circuitry.

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Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jean B Jeanglaude whose telephone number is 571-

272-1804. The examiner can normally be reached on Monday - Friday 7:30 A. M. - 5:00

P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Michael Tokar can be reached on 571-272-1812. The fax phone number for

the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Jean Bruner Jeanglaude

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March 15, 2004

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